SCIENTIFIC CALCULATOR

Please read before operating the unit

DS-700

DATEXX

This Datexx DS-700 Scientific Calculator is designed for a variety of scientific, statistical and computer uses. It provides many important functions necessary for complex calculations.

FEATURES

Removable protective cover doubles as a base for the calculator.

Large easy to read LCD (Liquid Crystal Display).

Binary-Octal-Hexadecimal-Decimal conversion.

Built-in Random Number Generator.

Built-in Trigonometric and Algebraic Functions.

TABLE OF CONTENTS

(LCD) LIQUID CRYSTAL DISPLAY FORMAT
FLOATING POINT DISPLAY
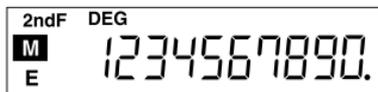
SCIENTIFIC NOTATION DISPLAY
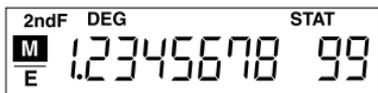
DISPLAY SYMBOLS

– Negative symbol
Indicates the displayed number is a negative number.

M Memory symbol
Appears when number is stored in memory.

2ndF Second function symbol
Appears when 2ndF is pressed, allowing access to alternate key functions.

HYP Hyperbolic function designation symbol
Appears when a hyperbolic function is designated.

DEG Degree mode symbol
Appears when degree mode is designated or shows that the angular mode of the converted result is in degrees.

RAD Radians mode symbol
Appears when radian mode is designated or shows that the angular mode of the converted result is in radians.

GRAD Grad mode symbol
Appears when grad mode is designated or shows that the angular mode of the converted result is in grads.

( ) Parenthesis symbols
Appears when a calculation with parenthesis is performed by pressing the parenthesis key.

BIN   Binary mode symbol

Appears when the binary mode is set or the displayed result is a binary number.

OCT   Octal mode symbol

Appears when the octal mode is set or the displayed result is an octal number.

HEX   Hexadecimal mode symbol

Appears when the hexadecimal mode is set or the displayed result is a hexadecimal number.

CPLX Complex number mode symbol

Appears when the complex number mode is set.

STAT   Statistical mode symbol

Appears when the statistical calculations mode is set.

A calculated result is displayed as a floating point number within the range of:
$0.000000001 \leq 1 \times x \leq 9999999999$
Results outside this range are displayed in scientific notation.

SETTING UP DISPLAY FORMAT

Display Format

Press TAB key to change format from floating point to scientific notion

Change to scientific notion

$\underset{\text{(F↔E)}}{\text{tab}}$

DEG
0.00 00

Change to floating point

$\underset{\text{(F↔E)}}{\text{tab}}$

DEG
0.00

Setting Decimal Point

Press 2ndF, TAB and Number of digit

Example: Decimal Point 4

(2ndF)

$\underset{\text{(F↔E)}}{\text{tab}}$

DEG
0.0000

$\boxed{4}$
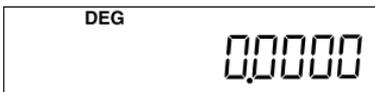
Example: Decimal Point 6

(2ndF)
tab
(F↔E)

```
    DEG
 0.000000
```

6

Please note:

Once the decimal point is set, it will remain after power is off, to resume decimal point 2 (default), Please set the decimal point to 2 again.

Example:
Setting back to Decimal Point 2

(2ndF)
tab
(F↔E)

```
    DEG
    0.00
```

2
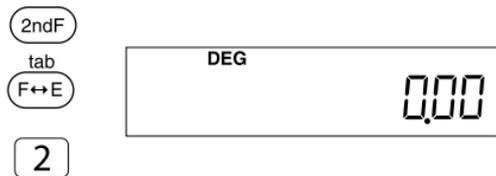
OPERATING THE CALCULATOR

(OFF) **Power off key**
Press to turn off the calculator. Automatically turns off 8 minutes after last keypress to conserve battery power.

(ON/C) **Power on and clear / statistical calculation mode key**
Press to turn on the calculator or to clear the display.

(2ndF)
(ON/C) Press to activate statistical program. The display is cleared and **STAT** appears in the display. In this mode the), x -->m, RM and M+ keys function as the n, x, S and DATA keys respectively. Press 2ndF to activate the Σx, Σx2, Ó and CD keys.

2nd function key
(2ndF) Press to use alternate functions located above most keys.

DRG► **OFF**
Degree / Radian / Grad selector / angular unit conversion key
Use to calculate trigonometric and coordinate conversion. The DRG key changes the angular mode with each press:
DEG -> RAD -> GRAD -> DEG.

DEG MODE - Entries and results are in decimal degrees.
RAD MODE - Entries and results are in radians.
GRAD MODE - Entries and results are in grads.

2ndF
Functions the same as the DEG key. The displayed number is converted into a number of the specified angular mode.

DRG► **OFF**
Hyperbolic / Arc Hyperbolic key

arc hyp **hyp**
Used with trigonometric functions for hyperbolic calculations.

2ndF
arc hyp **hyp**
Used with trigonometric functions for arc hyperbolic calculations.

Trigonometric / Inverse Trigonometric function keys

$\sin^{-1}$ $\cos^{-1}$ $\tan^{-1}$
sin   **cos**   **tan**

Press for the desired trigonometric function. Press 2ndF first for inverse trigonometric functions.

tab **F↔E**
Display Format Exchange / Tabulation key
Press to change display format from floating point to scientific notation and back again.

2ndF **tab** **F↔E**
Press 2ndF, TAB, then a digit to specify the number of decimal tab places in the displayed result.

n! / CE · **2ndF n! / CE** — **Clear Entry / Factorial key**
Press to clear the display of an incorrect number.

Calculates the factorial of the displayed number.

D.MS D →DEG — **Degree / Minutes / Second ƒ Decimal degrees conversion / Hexadecimal number key**
Converts degree / minute / second to decimal degree.
Press 2ndF first to convert decimal degree to degree / minute second.

Hexadecimal number D key (HEX mode only).

e^x E / in — **Natural Logarithm / Antilogarithm number key**
Used to obtain the logarithm base e (e= 2.718281828).

Hexadecimal number E key (HEX mode only).

2ndF e^x E / in — Calculates the antilogarithm base e of the displayed number.

10^x F / log — **Common logarithm / antilogarithm and hexadecimal number key**
Press to obtain the base 10 logarithm of the displayed number.
Hexadecimal number F key (HEX mode only).

2ndF 10^x F / log — Press to obtain the base 10 antilogarithm of the displayed number.

→$r\theta$ / a — **Real number enter / coordinate conversion key**
Used when the real parts of complex numbers are entered and when calling the real parts of calculated results.

Used during coordinate conversions when entering the x coordinate of the rectangular coordinate (X, Y) or the r of the polar coordinate. Also displays the calculated values of X or r.

$\overset{\rightarrow r\,\emptyset}{\underset{\text{a}}{(2ndF)}}$ Press to convert polar coordinates to rectangular coordinates.

$\overset{\rightarrow xy}{(\text{b})}$ **Imaginary number enter / coordinate conversion key**
Press to input the imaginary parts of complex numbers or to display the imaginary parts of a calculated result.

$\overset{\rightarrow xy}{\underset{\text{b}}{(2ndF)}}$ During coordinate conversions, press to enter the retangular y coordinate, or the ø of the polar coordinates (r, ø). Also used to display the calculated values of y or ø.

Press to convert polar coordinates to rectangular coordinates.

$\overset{\text{CPLX}}{(\leftrightarrow)}$ **Right Shift / Complex number mode key**
Press to delete the last number key pressed.

$\overset{\text{CPLX}}{\underset{}{(2ndF)}}$ Press to set the complex number mode.
$(\leftrightarrow)$

$\overset{\pi\ \text{a}}{(\text{EXP})}$ **Enter Exponent / Pi and Hexadecimal number key**
Press to enter a number in scientific notation. Hexadecimal number A key (HEX mode only).

$\overset{\pi\ \text{a}}{\underset{(\text{EXP})}{(2ndF)}}$ Displays the value of Pi (π) Pi= 3.141592654

y /x$\sqrt{}$ y and Hexadecimal number key

Raises the displayed number to a power.
$\overset{x\sqrt{y}B}{(\text{y}^x)}$ Hexadecimal number B key (HEX mode only).

$(2ndF)$ Calculates the Xth root of Y.

$x\sqrt{yB}$
(y^x)

$3\sqrt{B}$
$(\sqrt{})$ **Square root / cube root and hexadecimal number key**

Calculates the square root of the displayed number. Hexadecimal number B key $(2ndF)$ (HEX mode only).

$3\sqrt{B}$
$(\sqrt{})$ Calculates the cube root of the displayed number.

$1/x$
(X^2) **Square / reciprocal key**
Calculates the square of the displayed number.

$(2ndF)$ Calculates the reciprocal of the displayed number.

$1/x$
(X^2) **Open parenthesis / exchange key**

↕
$(\ (\ )$ Press to enter an open parenthesis in the display.

$(2ndF)$
↕
$(\ (\ )$ Press to exchange the displayed number with the number from the working register $(x \to y)$

$n\ \Sigma x$
$(\ )\ )$ **Close parenthesis / statistical calculation key**
Press to enter a close parenthesis in the display. In statistical mode it displays the number of the samples entered. (n)

$(2ndF)$ Press to obtain the sum of the
$n\ \Sigma x$ data (Σx)
$(\ )\ )$

Number keys
Press to enter number 0-9.

$\boxed{0}$ $\boxed{1}$ $\boxed{2}$ ···· $\boxed{9}$

→ BIN

$\boxed{\div}$ Division / binary number key
Press for division.

(2ndF)
→ BIN
$\boxed{\div}$

Press to convert the displayed
number to a binary
number(base 2).

→ OCT

$\boxed{\mathbf{X}}$ **Multiplication / Octal num-
ber key**
Press for multiplication.

(2ndF)
→ OCT
$\boxed{\mathbf{X}}$ Press to convert the displayed
number to an octal
number(base 8).

→ HEX

$\boxed{-}$ **Subtraction / Hexadecimal
number key**
(2ndF)
→ HEX Press for subtraction.
$\boxed{-}$

Press to convert the displayed
number to a hexadecimal
number (base 2).

Plus / Decimal number key
→ DEC Press for addition.
$\boxed{+}$

Press to convert the displayed
(2ndF) number to a decimal number
→ DEC (base 10).
$\boxed{+}$

$\bar{x}\sum x^2$
$\boxed{x\rightarrow M}$ **Memory-in / statistical calcula-
tion key**
Press to store the displayed num-
ber into memory. To clear the
memory, press the ON/C key then
the x-> m key. In statistical mode,
press to obtain the mean value of
the data.

Press to obtain the sum of
squares of the data ($\sum x^3$)
(2ndF)
$\bar{x}\sum x^2$
$\boxed{x\rightarrow M}$ **Recall memory / Statistical cal-
culation key**
s O
$\boxed{RM}$ Displays the contents of the mem-
ory. In statistical mode, press to
obtain the standard the deviation
of the data simple.

(2ndF)
s O
$\boxed{RM}$ Press to obtain the standard
deviation of the population of
data.

18   19

→ HEX **Memory plus / DATA CD key**
⊟ Press to add the displayed num-
(2ndF) ber to the contents of the
→ HEX Memory. To subtract the displayed
⊟ number from the memory, press
the +/- key first. In statistical
mode, press to enter data.
In statistical mode, press to delete
a wrong data entry.

(2ndF)
DATA CD **Change sign key**
[M+] Press to change the displayed
number from positive to negative
[+/-] and vice versa.

**Decimal point / random
number key**   Press to
RND
[·] place a decimal point number in
the display.
(2ndF)
RND Press to generate random num-
[·] bers between 0.000 and 0.999
(Decimal mode only).
%
[=] **Equals /Percent key**
Displays the results of arith-
(2ndF) metic and complex calcula-
% tions.
[=] Used for percentage calcula-
tions.

20

ONE FACTOR OPERATIONS
One-Factor operations require the entry
of only one mathematical function. The
single factor is entered into the calcula-
tion when you press the function key. You
do not have to press = to complete the
calculation.

Some one-factor functions include √, cos,
sin, tan and log.

Example:
sin 90° = 1
Enter 90 [sin]. 1 is displayed

TWO-FACTOR OPERATIONS
Two-Factor operations require the entry
of at least two mathematical funtions.The
first factor is entered when you press the
function key such as +, --, x, ÷, or yx .
The second factor is entered when you
press the = key and the calculation is
completed.

Example: 7 x 5 = 35

Enter 7 [x] 5 [=] . 35 is diplayed.

Two factor functions can be chained
together but algebraic hierarchy is always
in effect. To perform a calculation of a
lesser

21

hierarchy first, press [=] to perform the higher hierarchy calculation, then enter the lower hierarchy calculation to get an accurate result.

Example: (10 + 5) ÷ 3 = 5

Incorrect: 10 [+] 5 [÷] 3 = 11.6667

Correct: 10 [+] 5 [=] 15
          [÷] 3 = 5

With this method, calculations can be performed in the proper order.

CORRECTING INCORRECT ENTRIES
If you press the wrong function key (+, --, x, or ÷), just press the correct function after pressing the wrong one. The calculator preforms the last function pressed.

Example: If you press the 5 + -- x 5 =, the displayed result will be 25 as [x] was the last function key pressed.

If you press the wrong number key, press [ON/C] once to clear the last entry, or twice to clear all entries made. Entries made with the memory keys are not affected.

CORRECTING OVERFLOW ERRORS
If a calculated result exceeds the display ability or the memory capacity, the display stops and E appears in the display. Press [ON/C] to resume calculating.

The range of calculated results and memory capacity are within the range of 1 x 10 -99 to 9.9999999 x 10 99

An error also occurs if you try to divide a number by 0 or extract the square root of a negative number.

CALCULATION EXAMPLES MIXED
$$2 \times 8 - \frac{(3 + 5) \times 4 - 6 \times 7}{4.3 - 1.8} = 20$$

Press	Display	Memory Contents
3 [+] 5 [=] [x] 4 [=] [M+]	M 32	32
6 [x] 7 [+/−] [=] [M+]	M−42	−10
4.3 [–] 1.8 [=]	M2.5	−10
[÷] [RM] [=] [2ndF] [1/x]	M−4	−10
[+/–] [x-->M]	M 4	4
2 [x] 8 [=] [M+]	M 16	20
[RM]	M 20	20

CONSTANT AND REPEAT
When performing calculations, the last function and number entered are retained as a constant.

Examples:

To calculate $7 + 5 + 5 + 5 = 22$
Press 7 [+] 5 [=] [=] 22
In this case [+] and 5 are the constants.

To calculate $2 + 3 = 5$ and $4 + 3 = 7$
Press 2 [+] 3 [=] 5   5
       4 [=]   7

In this case [+] and 3 are the constants.

When calculating powers
$5^2 = 25$ and $4^2 = 16$

Press 5 [yx]   2 [=]   25
                4 [=]   16

In this case [yx] 2 is the constant.

SCIENTIFIC NOTATION
Calculate

$$\frac{(72.5 \times 10^{20} = 1.75 \times 10^{20})}{(-4.7 \times 10^{-11})}$$

$= -1.57978 \times 10^{32}$

To Calculate	Press	Display
$(72.5 \times 10^{20}$	(72.5 [EXP] 20 [+]	7.25 21
$1.75 \times 10^{20})$	1.75 [EXP] 20 [=]	7.425 21
$\div (-4.7 \times 10^{-11}$	[÷] 4.7 [+/−] [EXP]11[+/−]	−4.7 −11
$= -1.57978 \times 10^{32}$	[=]	−1.5797872 32

If a result is displayed in scientific notation, you can press [F <--> E] to convert the number to floating point and vice- versa.

PERCENTAGE

To Calculate	Press	Display
6% of 1250 =75	1250 [X] 6 [2ndF][%][=]	75
65 + 15% =74.75	65 [+] 15 [2ndF][%][=]	74.75
129.95 – 10% =116.955	129.95 [–] 10 [2ndF][%][=]	116.955

LOGARITHM AND EXPONENTIAL

To Calculate	Press	Display
log 0.02 = −1.69897	0.02 [log]	−1.698970004
ln (50/3) =2.8134107	50 [÷] 3 [=] [ln]	2.813410717
7^{10} =2.82475x10^8	7[y] 10 [=]	282475249
$^5\sqrt{56}$ =2.236854	56 [y^x] 3 5 [2ndF] [1/x] [=]	56 5 2.236853829

TRIGONOMETRIC CALCULATIONS
Repeatedly press DEG to select degrees, radians or grads as the trigonometric unit.

To calculate
cos-1 0.5 = 66.666666 grads

Angular Mode	Press	Display
GRAD	0.5 [2ndF] [cos^{-1}]	6.666667

To calculate
tan π/5 = 0.72654253

Angular Mode	Press	Display
RAD	[2ndF] [π] [÷] 5 [=] [tan]	0.62831853 0.726542528

To calculate
sin 30˚ x $\sqrt{5}$ = 1.118034

Angular Mode	Press	Display
DEG	30 [sin] [x] 5 [$\sqrt{}$] [=]	0.5 1.118033989

To calculate
90˚ = 1.5707963 radians
= 100 grads

Angular Mode	Press	Display
DEG	90	90
RAD	[2ndF] [DRG->]	1.570796327
GRAD	[2ndF] [DRG->]	100

APPLICATIONS AND EXAMPLES

BUSINESS

Calculate the future value of a $1000 investment compounded annually at a rate of 6% for 7 years.

$$FV = p (1+i)n$$
$$= 1000 (1+0.06) 7$$
$$= 1503.63$$

Press	Display
1 [+] 0.06 [=] [y^x] 7	
[=]	1.503630259
[X] 1000 [=]	1503.630259

### PHYSICS

If a ball is thrown upwars with a velocity of 75 feet per second, what is its velocity at the end of 1.6 seconds

(g = 32.2 ft/sec2) ?

Velocity: $V = Vo - gl$
$= 75 - (32.2 \times 16)$
$= 23.48$ ft/sec.
Height: $S = Vol - 1/2 gl2$
$= (75 \times 1.6) - (1/2 \times 32.2 \times (1.6)^2)$
$= 78.784$ ft.

Press	Display
75 [–] 32.2 [X] 1.6 [=]	23.48
75 [X] 1.6 [–] 2 [2ndF][1/x][X] 32.2 [X] 1.6 [X^2] [=]	0.5 78.784

CIVIL ENGINEERING

Trigonometric Functions

$\sin a = A/C$
$\cos a = B/C$
$\tan a = A/B$
$\sin b = B/C$
$\cos b = A/C$
$\tan b = B/A$
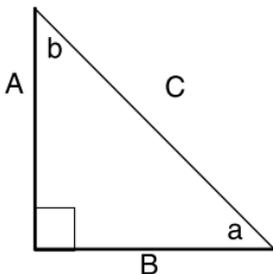
In this right triangle,
A = 5.7 feet and a = 30 degrees.
Determine the value of C.

$\sin a = A/C$
$\sin 30$ degrees $= 5.7/C$
$C = 5.7 / \sin 30$ degrees
$C = 5.7 / 5$
$C = 11.4$

| Angular Mode	Press	Display
DEG	5.7 [÷]	5.7
	30 [sin]	0.5
	[=]	11.4

In another right triangle,
A = 6 feet and C = 15 degrees.
Determine the value of a, b and B.

sin a = A /C
sin a = 6 / 15 = 0.4
sin-1 .4 = 23.58
a = 23.58 degrees
b = 90 - 23.58 = 66.42 degrees
cos a = B / C
cos 23.58 = B /15
B = cos 23.58 x 15
B = .92 x 15 = 13.75 feet

Angular Mode	Press	Display
DEG	0 [X->M]	0
	6 [÷]	6
	15 [=]	0.4
	[2ndF] [sin $^{-1}$]	23.57817848
	[M+]	M 32.57817848
	90 [–] [RM] [=]	M 66.42182152
	0 [X->M]	0
	23.58 [cos]	0.916502421
	[X] 15 [=]	13.74753633

ELECTRONICS

Amplifier Gain
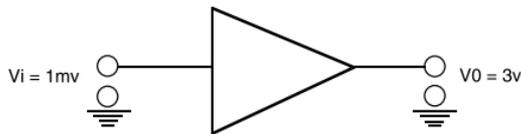
Calculate the value of Av

Voltage gain AV = 20 log Vo/ Vi

$$= 20 \log \frac{3}{1 \times 10^{-3}}$$
$$= 69.54242509 dB$$

Press	Display
3 [÷] [EXP] 3 [+/–]	1.–03
[=] [log] [X]	3.477121225
20 [=]	69.54242509

PARALLEL RESISTANCE

Three resistors are connected in parallel. Their values are 540 ohms, 470 ohms and 680 ohms.
Calculate the total equivalent resistance.

$$Req = \frac{1}{\frac{1}{R1} + \frac{1}{R2} + \frac{1}{R3}}$$

$$Req = \frac{1}{\frac{1}{680} + \frac{1}{470} + \frac{1}{540}}$$

Press	Display
680 [2ndF] [1/x] [+]	0.001470588
470 [2ndF] [1/x] [+]	0.003598247
540 [2ndF] [1/x] [=]	0.005450 100
[1/x]	183.4828833

CARE AND MAINTENANCE

Attempting to modify or tamper with the caclulator's interal components can cause a malfunction and invalidate the warranty.

REPLACING THE BATTERIES
This calculator is powered by two internal batteries LR 44 or A76. If the display gets dim or calculations slow down the batteries should be replaced.

To replace the batteries:

1.Remove the six screws on the back of the calculator and lift off the back cover.

2.Replace the two batteries located near the tip of the calculator with new batteries following the polarity shown in the illustration.

3.Replace the back cover and screws.

BATTERY PRECAUTIONS

1.Only use the size and type of batteries specified.

2.Follow the correct polarity when installing the batteries. Reversed batteries can cause damage to the calculator.

3.If the calculator is not going to be used for a long period of time, remove the batteries to prevent the damage or injury from possible battery leakage.

Datexx Limited Warranty

This product is warranted against defects for 1 year from date of purchase. Within this period, we will replace or repair it, at our option, without charge for parts and labor, with the exception of accessories such as batteries, wallets, etc.

Return the defective unit with proof of purchase and a check or money order for $5.00 (to cover postage, insurance and handling) to Teledex Service Center, 1 Atlas St., Kenilworth, NJ, 07033.

This warranty does not cover products subjected to misuse, accidental damage, or repair by other than TELEDEX. In no event shall TELEDEX be liable for consequential economic damage or damage to property.

Except as provided herein, DATEXX makes no express warranties and any implied warranties are limited in duration to the written limited warranties contained herein. Some states do not permit limitation or exclusion of implied warranties; therefore, the aforesaid limitation(s) or exclusion(s) may not apply to the purchaser.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

WWW.DATEXX.COM